

From: Stoick, Paul T CIV USN (USA) [/o=Organization/ou=First Administrative Group/cn=Recipients/cn=paul.stoick]
Sent: Thursday, April 18, 2019 12:59 PM
To: Robinson, Derek J CIV USN NAVFAC SW SAN CA (USA) [derek.j.robinson1@navy.mil]
CC: Janda, Danielle L CIV USN (USA) [danielle.janda@navy.mil]
Subject: FW: Final Issue of HPNS D-1 RACR, Ship Berths FSSR, and NRDL FSSR
Attachments: Final RACR 040119 Marked Up Pages (corrected).pdf

Derek,

We're good to go on the changes for the Final Issue of the HPNS D-1 RACR. Gilbane provided a good explanation in the forwarded e-mail chain, but we're planning to submit "clean" copies of the Final to avoid the change-page confusion. I think I will need to process a lean contract modification for the additional deliverable, but Gilbane was seeing if they could support it through unused meeting funding.

Do you recommend I give the BCT a head's up, outline the changes and let them know we will be submitting the Final next week? Gilbane will need a few days for producing the document. I'll follow up with a transmittal letter as well.

V/r,
Paul

From: Cooper, Jerry <JCooper@GilbaneCo.com>
Sent: Thursday, April 18, 2019 11:54 AM
To: Stoick, Paul T CIV USN (USA) <paul.stoick@navy.mil>
Cc: Acharya, Arvind <AAcharya@GilbaneCo.com>; Gilmore, Clare <CGilmore@GilbaneCo.com>
Subject: [Non-DoD Source] RE: Final Issue of HPNS D-1 RACR, Ship Berths FSSR, and NRDL FSSR

Hi Paul,
Your comments are good and forced me to go back and verify why the changes were being made. Other than a comment numbering error on the RACR RTC table (now fixed), I did not find anything that needed changing in the documents.

My responses to your comments are noted below. If my explanations properly address your comments, we should be ready to go.

Thanks.

Jerry

-----Original Message-----

From: Stoick, Paul T CIV USN (USA) [mailto:paul.stoick@navy.mil]
Sent: Wednesday, April 17, 2019 2:11 PM
To: Cooper, Jerry
Cc: Acharya, Arvind; Gilmore, Clare
Subject: FW: Final Issue of HPNS D-1 RACR, Ship Berths FSSR, and NRDL FSSR

Jerry,

Ok, I think we're getting there.

(1) For the RACR, the RTCs need to be replaced. I reviewed your mark-up and the clean RTC Table edited for Final RACR and they are consistent. The clean Final version of the RTCs will be incorporated into the Final RACR.

Gilbane response: First off, my apologies regarding the RACR marked up pages. The doc I sent was mislabeled and did not contain the RACR changes. The corrected RACR marked up pages, including the RTC table, are attached.

From the change page guidance, I'm not clear on pages 5-6, 15-16, 31-32, and 53-72. Danielle thinks there were changes related to ARICs, but I didn't see ARIC related language on them. I did find Hamide had a file for them - attached. If this was something settled long ago, I'm good-to-go assuming it captures everything.

Gilbane response: The reason for the changes are detailed the modified RTC table based on follow-up comments from the EPA, DTSC, CDPH, and SFDH, as follows:

- Page 5, Section 1.2, last paragraph, last sentence: the phrase "and does not include or affect any other designated HPNS parcels" was deleted based on Comment #38 from the SFDH.*
- Page 16, Section 3.2, 2nd paragraph: the sentence "Locations with measurements greater than three standard deviations above the data set mean were routinely selected for biased sampling" was added in response to Comment #35 from the SFDH.*
- Page 32, Section 4.7, next to last paragraph: the sentence was modified to add, "of samples collected from both systematically-spaced and biased locations representing the post-remediation or "as-left" trench surfaces" in response to Comment #40 from the EPA.*
- Pages 53-72, Section 8.3, Exhibit 8-8, and Section 13.3 were modified to address Comments 1, 4, 32-33, 37, 39, and 41-43 from DTSC, CDPH, and SFDH regarding buffer zones and ARICs (see modified RTC table that includes DF comments).*

(2) For the Ship Berth FSSR, the clean technical memorandum will need to be included, removing the Tt references and RTCs replaced. This looks good to go.

Gilbane response: Okay.

(3) For the NRDL FSSR, the RTC addition is good to go, but Danielle was not familiar with the Page 9-10 change-out. It looks like the language that "no discrete radiological object was identified...reference area" was added. Is this something that changed more recently, or earlier on? It doesn't seem like a major issue, just wanted to understand where it was coming from.

Gilbane response: Page 10, Section 4.3, 3rd paragraph: the sentence "No discrete radiological objects have been identified in or recovered from the reference area. The closest object found was approximately 30 m north of the reference area" was added in response to the EPA's evaluation of the response to Item #7, EPA Specific Comment #3, contained in the supplemental RTC page that will be added to Appendix J, Response to Comments.

I'm also hoping to hear back from admin record with regard to production requirements.

Thanks!

V/r,
Paul

-----Original Message-----

From: Janda, Danielle L CIV USN (USA) <danielle.janda@navy.mil>
Sent: Tuesday, April 16, 2019 2:44 PM
To: Stoick, Paul T CIV USN (USA) <paul.stoick@navy.mil>
Subject: RE: Final Issue of HPNS D-1 RACR, Ship Berths FSSR, and NRDL FSSR

Unless something has changed, this is what should be done for the Final:
The RTCs in the Draft-Final Ship Berths FSSR needs to be replaced with the attached "Appendix N RTC Table-edited for final RACR.pdf". This is what was sent to EPA (see attached email chain). Jerry also had to update the tech memo to remove references to Tt (see attached email from Jerry). I believe what he sent reflects this but you might want to double check it. There are also replacement pages for the RACR that are unchanged based on EPA discussions.

V/r,
Danielle Janda
(619)524-5724

-----Original Message-----

From: Stoick, Paul T CIV USN (USA) <paul.stoick@navy.mil>
Sent: Tuesday, April 16, 2019 12:37 PM
To: Janda, Danielle L CIV USN (USA) <danielle.janda@navy.mil>
Subject: FW: Final Issue of HPNS D-1 RACR, Ship Berths FSSR, and NRDL FSSR

Danielle,

Hate to haunt you with a past project, but Lawrence stopped by a couple of weeks ago and said we are good to go with finalizing the D-1 RACR with the agreed to language. I followed your turnover page, and think we are good to go with the replacement RTCs, but Jerry was apprehensive that he may have not been involved in the back and forth. Jerry also mentioned a technical memo as an appendix.

Do you remember if there was agreed to language, or was it just the RTC replacement (and that's the agreed to language)?

V/r,
Paul

-----Original Message-----

From: Cooper, Jerry <JCooper@GilbaneCo.com>
Sent: Thursday, April 11, 2019 1:20 PM
To: Stoick, Paul T CIV USN (USA) <paul.stoick@navy.mil>
Cc: Acharya, Arvind <AAcharya@GilbaneCo.com>; Gilmore, Clare <CGilmore@GilbaneCo.com>
Subject: [Non-DoD Source] RE: Final Issue of HPNS D-1 RACR, Ship Berths FSSR, and NRDL FSSR

Hi Paul,

To facilitate your final review and any questions you may have for Danielle, attached are the marked up pages that constitute all of the non-editorial changes to the draft final versions of the documents being made to take them to final. Ignore formatting, page numbers, etc., which will all be fixed.

Once you are good with everything, please send the transmittal letter which we will use as authorization to proceed with production and distribution.

Thanks.

Jerry

-----Original Message-----

From: Cooper, Jerry

Sent: Tuesday, April 09, 2019 1:20 PM

To: 'Stoick, Paul T CIV USN (USA)'

Cc: Acharya, Arvind; Gilmore, Clare

Subject: RE: Final Issue of HPNS D-1 RACR, Ship Berths FSSR, and NRDL FSSR

Hi Paul,

We can issue for distribution hardcopy sets of the final versions for the RACR, NRDL FSSR, and the Ship Berths FSSR. You and Arvind can work out the contract details. I haven't checked with Production folks, but this Friday may be too tight. If you are planning on holding and touching base with Danielle when she returns to work next Monday, I am confident we would be able to get the docs issued next week no problem.

Attached are the printed hardcopy replacement page sets for the RACR and the Ship Berths FSSR.

Jerry

-----Original Message-----

From: Stoick, Paul T CIV USN (USA) [mailto:paul.stoick@navy.mil]

Sent: Tuesday, April 09, 2019 12:53 PM

To: Cooper, Jerry

Cc: Acharya, Arvind; Gilmore, Clare

Subject: RE: Final Issue of HPNS D-1 RACR, Ship Berths FSSR, and NRDL FSSR

Jerry,

Both versions of the .pdf work, but the printed is significantly smaller in size. You can send them the printed way.

I need to prepare a transmittal letter - would Friday the 12th work for a date to send out?

V/r,

Paul

-----Original Message-----

From: Cooper, Jerry <JCooper@GilbaneCo.com>
Sent: Monday, April 8, 2019 11:31 AM
To: Stoick, Paul T CIV USN (USA) <paul.stoick@navy.mil>
Cc: Acharya, Arvind <AAcharya@GilbaneCo.com>; Gilmore, Clare <CGilmore@GilbaneCo.com>
Subject: [Non-DoD Source] RE: Final Issue of HPNS D-1 RACR, Ship Berths FSSR, and NRDL FSSR

Paul:

Attached is the NRDL FSSR replacement page .pdf doc prepared using two different approaches. Let me know which works and I'll prep and send the RACR and Ship Berths docs to you the same way.

Thanks.

Jerry

-----Original Message-----

From: Stoick, Paul T CIV USN (USA) [mailto:paul.stoick@navy.mil]
Sent: Monday, April 08, 2019 10:31 AM
To: Cooper, Jerry
Cc: Acharya, Arvind; Gilmore, Clare
Subject: RE: Final Issue of HPNS D-1 RACR, Ship Berths FSSR, and NRDL FSSR

Jerry,

I meant to get back to you sooner - I was TDY up at HPNS most of last week.
Thank you for the background - very helpful.

There is a font issue with the pdfs - and I am not able to see the text. Is there any way to change the following fonts to allow me to see the text?

The Final RACR has an issue with the font 'PLIIH+Cambria-Bold'
The Final Ship Berth FSSR replacement pages has an issue with the font 'MLNEKO+Cambria-Bold'
The Final NRDL FSSR has an issue with the font 'IJKHE+Cambria-Bold'
No font issue with the change out guidance sheet.

Was the change page agreement made a while back? I'm just wondering given the long delays and informal dispute, if it would make sense to produce a final document. If the number of change pages are limited, then should be fine with that approach.

Thanks!!

V/r,
Paul

-----Original Message-----

From: Cooper, Jerry <JCooper@GilbaneCo.com>
Sent: Tuesday, April 2, 2019 1:29 PM
To: Stoick, Paul T CIV USN (USA) <paul.stoick@navy.mil>
Cc: Acharya, Arvind <AAcharya@GilbaneCo.com>; Gilmore, Clare <CGilmore@GilbaneCo.com>

Subject: [Non-DoD Source] Final Issue of HPNS D-1 RACR, Ship Berths FSSR, and NRDL FSSR

Paul,

Here's some background that you may already be aware of. The D-1 RACR includes three documents that are to be issued final simultaneously. They are: (1) D-1 RACR, (2) Ship Berths FSSR, and (3) NRDL FSSR. Two issues primarily prevented the three documents from going to final nearly 1 ½ years ago: (1) technical constraints on Gilbane being able to recommend unrestricted release for Parcel D-1 soil below 2 ft bgs, and (2) resolution of EPA's concern regarding Po-210 and the bollards. With the Navy having resolved and/or taken a position regarding these outstanding issues, the three documents can move to final.

Pursuant to the Navy's agreement with Gilbane, the draft final versions of the documents will be finalized by issuance of replacement pages and new CDs. No complete hardcopy documents will be produced, just replacement pages.

Attached are the sets of draft final-to-final replacement pages for the D-1 RACR, Ship Berths FSSR, and NRDL FSSR. Also attached is a Sheet Change-Out Guide. Please review and approve. Gilbane will then prepare, issue, and distribute hard copy replacement page sets for the hardcopy document holders, and complete copies on CD for everyone else.

The whole thing has a lot of history behind it. Let me know what questions we can answer and what else, if anything, you'd like us to do.

Thanks.

Jerry

Jerry Cooper, CHP, PMP | Principal Health Physicist/Corporate RSO | Gilbane
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<<http://www.gilbaneco.com/>>
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ELCR of 3×10^{-4} . The inclusion of ingestion-related pathways in the modeling assured that dose and risk results are well within project limits. If the modeling does not take into account the ingestion-related pathways the maximum dose and risk are reduced by 50 percent. Dose and risk modeling that considers reasonably anticipated reuse in accordance with the reuse plan (i.e., reuse that does not include ingestion of produce grown in native soil) results in the maximum dose dropping from 1.4 to 0.63 mrem/yr, and the maximum ELCR ~~being reduced~~ from 2.8×10^{-5} to 1.4×10^{-5} . These dose and risk results are more appropriate because they reflect actual site conditions for the residential scenario, which is the most conservative planned future use.

Once the Phase II removal actions were completed, survey and sampling were performed over a large portion of Parcel D-1 to address radiation anomalies that were identified outside of areas identified as radiologically impacted. Discrete radioactive objects (ROs) were removed and subsequently disposed of off-site. There are two important points to be made:

- ROs recovered outside of areas previously identified by the HRA (NAVSEA, 2004) as radiologically impacted do not appear to be from surface-related activities involving radioactive material. Their suspected source is material dredged from San Francisco Bay used to create the present shoreline. Since radioluminescent devices containing Ra-226 were used on ships, ship decontamination, repair, and dismantling activities occurring at or near piers could have resulted in deck markers, gauges, and small metal pieces being present in the dredge material.
- Based on the post-removal survey and sampling results, there is a high degree of confidence that discrete ROs in soil to a depth of 2 feet (ft) below ground surface (bgs) have been identified and recovered.

Based on the above, there is the potential for ROs to be present in material below 2 ft bgs in ~~Parcel D-1 Phase II~~ areas where shoreline expansion has occurred since 1946 (i.e., where dredged material from the Bay was used to create the present shoreline). Based on the Navy's understanding of how shoreline expansion occurred, ~~that the~~ potential is largely limited to areas ~~east of around~~ the 1946 shoreline (Exhibit 8-8). The likelihood of ROs ~~outside that area moving away from the 1946 shoreline~~ is considered incidental and of low probability. ~~Implementation of~~ Land use and activity restrictions ~~currently in place prohibit land-disturbing activities throughout Parcel D-1 in the interim until the Land Use Controls Remedial Design in the Final Design Basis Report For Parcel D-1, Hunters Point Naval Shipyard, San Francisco, California (ChaduxTt, 2011) is amended to as prescribed by the Draft Record of Decision for Parcels D-1~~

~~and UC 1, Hunters Point Shipyard, San Francisco, California (Navy, 2009) will~~ appropriately mitigate any risk to human health relating to the potential presence of ROs in material below 2 ft bgs.

In addition to the Phase II removal actions, radiological survey and sampling of Parcel D-1 areas outside of those identified as radiologically impacted in the HRA (NAVSEA, 2004) was performed to address discrete radiation anomalies that were identified previously by a Navy contractor near Ship Berths 22 and 29.

The Phase II removal action addressed chemical contamination only in relation to re-use as potential backfill material or waste characterization for disposal of excavated soil derived from removal of the SSSD lines in accordance with the *Execution Plan: Parcel D-1 Phase II Radiological Remediation and Support, Hunters Point Naval Shipyard, San Francisco, California* (Execution Plan; ITSI Gilbane, 2013b). This radiological RACR does not address chemical contamination ~~and does not include or affected any other designated HPNS parcels.~~

1.3 CURRENT AND FUTURE LAND USE

There is no current use of Parcel D-1. Following this removal action, and after other additional remedial activities are completed, Parcel D-1 will be transferred to the City and County of San Francisco for conversion to non-defense re-use. The future planned use of Parcel D-1 is mixed use residential and shoreline open space as described by the *Hunters Point Shipyard Redevelopment Plan* (San Francisco Redevelopment Agency, 2010). Public recreation access will be provided to the San Francisco Bay waterfront, and include open spaces, viewing area of the water and historic Shipyard facilities, the San Francisco Bay Trail, and restorative habitat areas.

1.4 WORK CONTROL

A series of work plan documents were prepared to guide completion of work activities performed as part of the Phase II removal action. These supporting documents are incorporated by reference and are available for review through the Environmental Restoration Program Record File (see Section 11.1).

1.4.1 Basewide Radiological Management Plan

The *Basewide Radiological Management Plan, Hunters Point Naval Shipyard, San Francisco, California* (RMP; ITSI Gilbane, 2013a) describes the survey and decontamination procedures and methodologies that were implemented by Gilbane in support of the radiological release of buildings, sites, structures, areas, materials and equipment at HPNS. The Basewide Storm Drain

height of approximately four inches (0.1 m) above the surface, moving at a speed of 1.5 ft (0.5 m) per second, with each pass spaced 1.5 ft (0.5 m), or less based on detector field of view, from the previous pass to achieve 100 percent coverage of the area being surveyed. The spacing of each pass coupled with the detector sensitivity and field of view ensured high-density survey coverage of the area being scanned.

GWS data were position correlated using a global positioning system (GPS) receiver mated with a graphical interface system field device. The GPS antenna was mounted above the detector in such a manner to limit obstructions to aid in keeping the best satellite resolution possible. Position-correlated measurement data were logged automatically at one-second intervals. Collected data were retrieved from the RS-700 and processed using numerical and graphical methods. First, the data were plotted to ensure adequate scan coverage. A tractor speed histogram was developed using the position-correlated data as a quality control check to verify the proper speed of the detector over the ground. The data were checked for errors as well as examined for potential outliers and other anomalous features. Descriptive statistics (e.g., range, median, mean, and standard deviation) were used to assess the data set. The data were graphed on a cumulative frequency diagram to test departure from normality and to reveal characteristics of the data distribution such as dissimilar populations and data set outliers that may not be apparent otherwise. [Locations with measurements greater than three standard deviations above the data set mean were routinely selected for biased sampling.](#)

~~Manual~~-s Surveys to further delineate suspected contaminated areas were performed using a Ludlum Model 44-10 gamma scintillation detector coupled to a Ludlum Model 2221 ratemeter scaler.

RS-700 and Ludlum Model 44-10 instrument data are included in Appendix B.

3.3 SAMPLING AND ANALYSIS

Sampling and analysis were performed in accordance with the SAP, included as Attachment 1 to the Execution Plan (ITSI Gilbane, 2013b). Except where available material to sample was limited, samples collected were approximately 1,000 grams in size. Visually identifiable foreign objects and debris were removed manually in the field. Samples were bagged in one-gallon resealable plastic bags, numbered, logged, and sent for laboratory analysis. Each sample was

The number and type of samples collected are shown in Exhibit 4-5. The sample results, summarized in Exhibit 4-6, demonstrate the effectiveness of the removal action. A single sample location in Zone G reported a Cs-137 concentration of 0.151 pCi/g, which exceeds Cs-137 clean-up goal of 0.113 pCi/g. A single sample location in Zone D reported a Sr-90 concentration of 0.404 pCi/g, which exceeds Sr-90 clean-up goal of 0.331 pCi/g. The soil containing the elevated radioactivity was removed and disposed as LLRW. Bounding samples were collected to verify remaining soil concentrations were below the clean-up goals.

Exhibit 4-5. Trench Sample Collection

Parameter	Number
Number of trench survey units	17
Systematic samples	340
Biased (based on GWS results) samples	110
Pipe footprint/bounding samples	88
Total samples collected	538

Exhibit 4-6. Summary of Trench Sample Results

Parameter	Radionuclide of Concern		
	Ra-226	Cs-137	Sr-90
Samples analyzed	538	538	67
Samples w/concentration > MDC	536	54	1
Number of sample exceedances	0	1 ^a	1 ^b
Lowest MDC (pCi/g)	0.0304	0.00917	0.0337
Highest MDC (pCi/g)	0.0508	0.0243	0.165
Minimum concentration (pCi/g)	< MDC	< MDC	< MDC
Maximum concentration (pCi/g)	1.03	0.151 ^a	0.404 ^b

Notes:

^a Single sample location in Zone G reported 0.151 pCi/g, which exceeds Cs-137 clean-up goal of 0.113 pCi/g. Soil containing elevated radioactivity removed and disposed as LLRW. Highest post-remediation (i.e., remaining) Cs-137 concentration was 0.107 pCi/g.

^b Single sample location in Zone D reported 0.404 pCi/g, which exceeds Sr-90 clean-up goal of 0.331 pCi/g. Soil containing elevated radioactivity removed and disposed as LLRW. Highest post-remediation (i.e., remaining) Sr-90 concentration was below MDC.

Dose and risk modeling of the trench surfaces was performed in RESRAD using the ~~sample~~ analytical results of samples collected from both systematically-spaced and biased locations representing the post-remediation or “as-left” trench surfaces. Modeling resulted in a maximum dose for the trenches in any zone of 1.2 mrem/yr with an ELCR of 2.0×10^{-5} .

Exhibit 8-5. Field Investigation Sample Collection

Type of Sample	Number
Bounding samples (excavation floor and walls)	20
Biased (based on highest count rate) samples	12
Stockpile samples (soil removed from excavation)	16
Total samples collected	48

Exhibit 8-6. Summary of Field Investigation Sample Results

Parameter	Radionuclide of Concern	
	Ra-226	Cs-137
Samples analyzed	48	48
Samples w/concentration > MDC	47	1
Number of sample exceedances	0	0
Lowest MDC (pCi/g)	0.070	0.038
Highest MDC (pCi/g)	0.170	0.070
Minimum concentration (pCi/g)	< MDC	< MDC
Maximum concentration (pCi/g)	0.904	0.046

8.3 ASSESSMENT OF RESULTS

As the result of the post-removal survey and sampling, four discrete ROs were identified and recovered. These are in addition to the eight ROs that were recovered earlier during the removal action implementation. The four ROs were recovered from investigation locations identified by analyzing the GWS data by ROI and contour mapping the results based on z-score. The results demonstrate how this method enables the discovery of discrete ROs with lower activities at greater depths (see Exhibit 8-7). The four ROs (RO-09 through -12) were recovered at depths between 1 to 3 ft bgs with radiation levels as low as 25 microroentgens per hour ($\mu\text{R/hr}$). The preceding eight ROs either had much higher activity or were recovered at a shallower depth.

8.3.1 Radiological Objects

Exhibit 8-8 shows the locations where the 12 ROs were recovered. Five ROs were recovered within the footprint of the former NRDL site, which was identified as a radiologically impacted area. Two ROs were recovered during excavation of SSSD lines. The remaining five ROs were recovered outside of areas identified in the HRA (NAVSEA, 2004) as radiologically impacted.

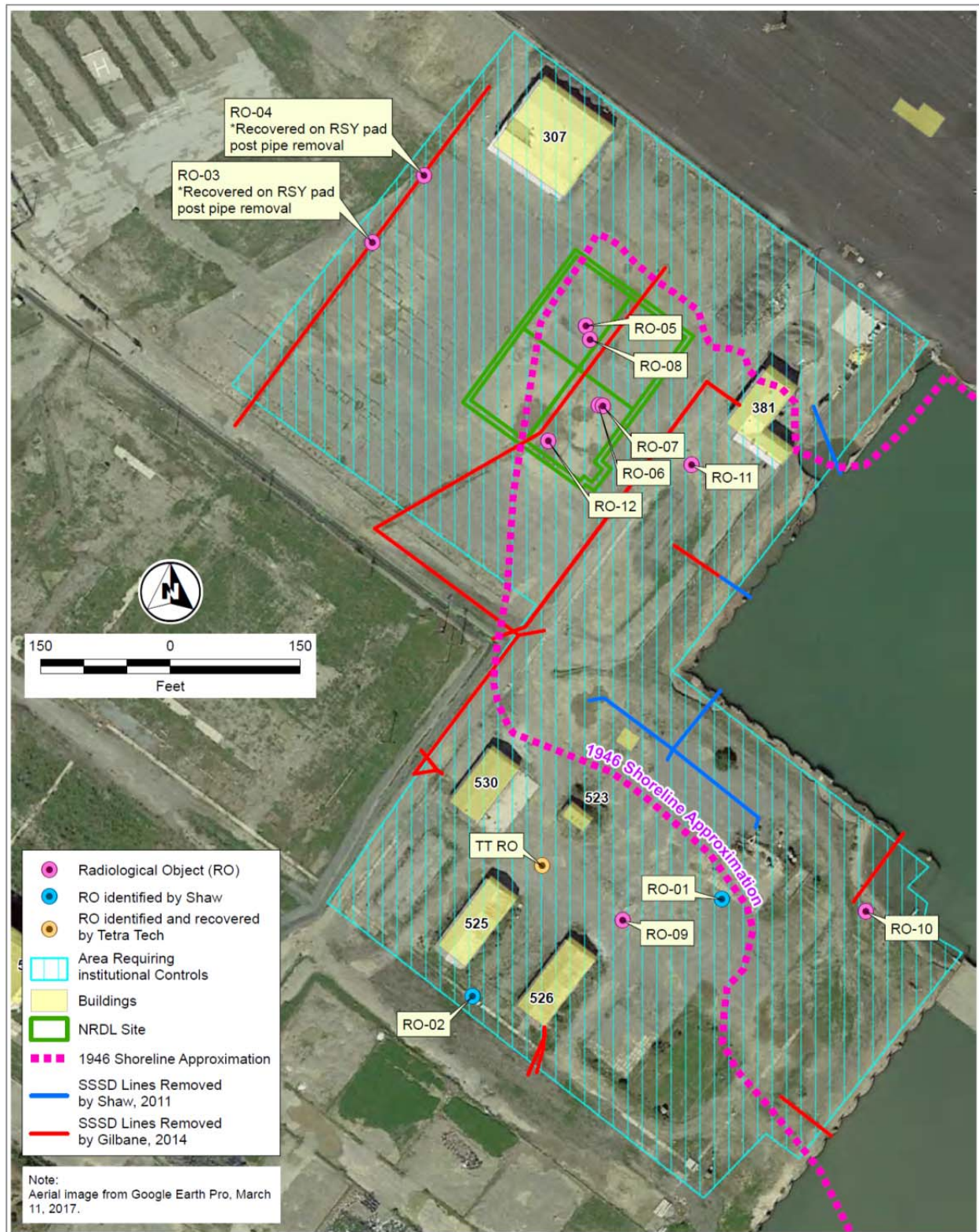
Exhibit 8-7. Recovered Radioactive Object Data

ID	How Identified	Highest Reading ^a (μR/hr)	Recovery Depth bgs (ft)	Description
RO-01	Previously identified by Shaw	3,200	0.5	Button or deck marker
RO-02	Previously identified by Shaw	23	0.5	Small chunk of soil with visible rust particles in it
RO-03	Located by GWS on RSY Pad D-28, with Soil Pile D0034, from Trench # 04-PD-015, Zone O	4,600	N/A	Deck marker
RO-04	Located by GWS on RSY Pad D-03, with Soil Pile D0036, from Trench # 04-PD-016, Zone P	4,900	N/A	Corroded and damaged deck marker
RO-05	Located by GWS of NRDL-NW survey unit after asphalt removal	1,500	0.5	1 ½ inch piece that looked like it had a clip on one side
RO-06	Located by the GWS of NRDL-SE survey unit after asphalt removal	480	1.5	Small chunk of soil with visible rust particles in it
RO-07	Located using Ludlum Model 44-10 after the removal of RO-06	60	1.5	Small chunk of soil with visible rust particles in it
RO-08	Located using Ludlum Model 44-10 while collecting biased samples around sample 04-PD-NRDL-NW-013	500	2-3	Corroded and damaged can of some materials
RO-09	Located using ROI contour mapping of GWS results.	460	2-3	Corroded and damaged metal gauge or can
RO-10	Located using ROI contour mapping of GWS results.	420	2-3	Small chunk of soil with visible rust particles in it
RO-11	Located using ROI contour mapping of GWS results.	25	1-2	Small chunk of soil with visible rust particles in it
RO-12	Located using ROI contour mapping of GWS results.	33	1-2	Small chunk of soil with visible rust particles in it

Note:

^aon-contact or near-surface reading

Exhibit 8-8. Locations where Discrete Radioactive Objects were Recovered



There are two important points to be made. First, the source of the five ROs recovered outside of areas previously identified by the HRA (NAVSEA, 2004) as radiologically impacted do not appear to be from surface-related activities involving radioactive material. Their suspected source is dredge material from San Francisco Bay used to fill in Parcel D-1. To illustrate this, an approximation of the 1946 shoreline was overlaid on the Exhibit 8-8 map showing the locations where discrete ROs were recovered. Material dredged from the Bay was used to create the present shoreline. Since radioluminescent devices containing Ra-226 were used on ships, ship decontamination, repair, and dismantling activities occurring at or near piers could have resulted in deck markers, gauges, and small metal pieces being present in the dredge material. Grading of dredge material is a ready explanation for the discovery of ROs outside of, but adjacent to, the 1946 shoreline.

Second, based on the post-removal survey and sampling results, there is a high degree of confidence that discrete ROs in the soil to a depth of 2 ft bgs have been identified and recovered. This is based on the sensitivity of the method described in Section 8.1. To illustrate, post-processing and analysis of the GWS data resulted in the identification and recovery of an RO within the former NRDL site after it had undergone an FSS. The GWS performed as part of the FSS did not identify the RO directly; however, post-processing and analysis of the GWS data from the former NRDL site and surrounding areas resulted in the location being investigated and the object being found.

Building on the two points above, there is the potential for ROs to be present in material below 2 ft bgs in Parcel D-1 Phase II areas where shoreline expansion has occurred in Parcel D-1 since 1946 (i.e., where dredge material from the Bay was used to create the present shoreline). Based on the Navy's understanding of how shoreline expansion occurred, ~~that~~ the potential is largely limited to areas ~~east of~~ around the 1946 shoreline. The likelihood of ROs ~~outside that area~~ moving away from the 1946 shoreline is considered incidental and of low probability. The potential for ROs at depth does not present a dose or risk greater than the results of the dose and risk modeling summarized in Section 13.2. Land use and activity restrictions (~~i.e., institutional controls (ICs)~~) that are ~~already~~ currently in place prohibit land-disturbing activities throughout Parcel D-1; ~~in the interim until the Land Use Controls Remedial Design (LUC RD) in the Final Design Basis Report For Parcel D-1, Hunters Point Naval Shipyard, San Francisco, California~~

(ChaduxTt, 2011) is amended to appropriately mitigate any risk to human health relating to the potential presence of ROs in material below 2 ft bgs.

Figures found in the HRA (NAVSEA, 2004), particularly Appendix C, illustrate what the area looked like before and after it was developed. There is some degree of uncertainty regarding the 1946 shoreline represented in Exhibit 8-8 supporting a conceptual site model where dredge material likely was used to build up the elevation of existing near-shore areas, as illustrated in Exhibit 8-9.

8.3.2 Conceptual Site Model

Grading and construction activities in the newly created and built-up land areas are the most likely explanation for the discovery of ROs outside of, but adjacent to, the 1946 shoreline approximation. Therefore, a buffer zone extending beyond the 1946 shoreline approximation is included with the 2 ft bgs restriction for Parcel D-1 Phase II (see Exhibit 8-8). .

Exhibit 8-9. Illustration of Backfilled Near-Shore Areas

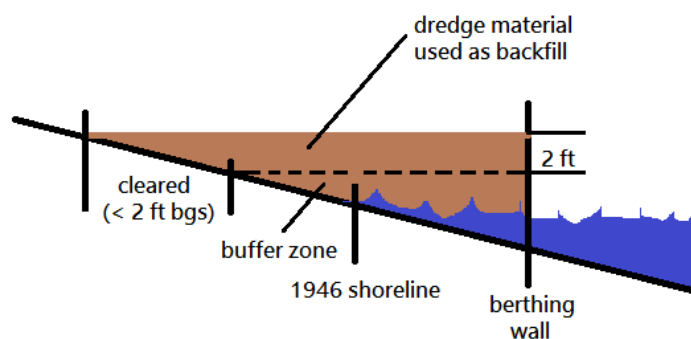


Exhibit 8-9 illustrates the purpose of a buffer zone. Though discrete ROs may have been identified and recovered to a depth of 2 ft bgs, areas backfilled with dredge material to depths greater than 2 ft bgs may extend further inland from the 1946 shoreline. The actual extent is a function of the original near-shore elevation gradient and the post-backfill final grade. That information is not available; therefore, an appropriately conservative buffer zone – encompassing discrete ROs found to date - should be established.

Three general considerations were used in placing the buffer zone shown in Exhibit 8-8. The area excluded from the area requiring restrictions does not require further action because:

1. It is furthest from the shoreline and represents the land area least likely to have been built up using dredge material;
2. It is radiologically dissimilar from the southeast portion of the RSY-2 screening pad area where the discrete ROs were found (see Exhibit 8-3); and
3. Over 2,200 linear ft of trenches were excavated ranging in depth from 2 to 8 ft. The 1,962 cy of excavated soil was radiologically screened without finding a single discrete RO.

The LUC RD (ChaduxTt, 2011), when amended, will identify the buffer zone extending beyond the 1946 shoreline approximation area as a radiological area requiring institutional controls (ARIC) below 2 ft bgs as depicted in Exhibit 8-8.

Turning off the ingestion-related pathways in the model – making the model consistent with the food consumption restrictions - reduces the maximum dose and risk by 50 percent. The maximum dose drops from 1.4 to 0.63 mrem/yr. The maximum ELCR drops from 2.8×10^{-5} to 1.4×10^{-5} . These dose and risk results are more appropriate because they reflect actual site conditions for the residential scenario, which is the most conservative planned future use. The RESRAD dose and risk results for the survey unit presenting the maximum dose and risk (Ship Berth Survey Unit 04-PD-SB-14S) are provided in Appendix Q.

Discrete ROs may exist in material below 2 ft bgs (see Section 13.3). However, their discrete form and buried condition severely restricts their ability to contribute significantly to external, inhalation, or ingestion exposure pathways.

13.3 DISCRETE RADIOACTIVE OBJECTS

Once the Phase II removal actions were completed, survey and sampling were performed over a large portion of Parcel D-1 based on radiation anomalies that were identified outside of areas identified as radiologically impacted. Discrete ROs were subsequently recovered. There are two important points to be made:

- ROs recovered outside of areas previously identified by the HRA (NAVSEA, 2004) as radiologically impacted do not appear to be from surface-related activities involving radioactive material. Their suspected source is material dredged from San Francisco Bay used to create the present shoreline. Since radioluminescent devices containing Ra-226 were used on ships, ship decontamination, repair, and dismantling activities occurring at or near piers could have resulted in deck markers, gauges, and small metal pieces being present in the dredge material.
- Based on the post-removal survey and sampling results, there is a high degree of confidence that discrete ROs in soil to a depth of 2 ft bgs have been identified and recovered.

Based on the above, there is the potential for ROs to be present in material below 2 ft bgs in Parcel D-1 Phase II areas where shoreline expansion has occurred in Parcel D-1 since 1946 (i.e., where dredge material from the Bay was used to create the present shoreline). Based on the Navy's understanding of how shoreline expansion occurred, ~~that the~~ potential is largely limited to areas ~~east of~~ around the 1946 shoreline. The likelihood of ROs ~~outside that area moving away from the 1946 shoreline~~ is considered incidental and of low probability.

~~Implementation of IL~~and use and activity restrictions ~~as prescribed by the ROD (Navy, 2009) and further detailed by the~~that are currently in place prohibit land-disturbing activities throughout Parcel D-1 in the interim until the LUC RDLand Use Controls Remedial Design in the ~~Final Design Basis Report For Parcel D-1, Hunters Point Naval Shipyard, San Francisco, California~~ (ChaduxTt, 2011) is amended to, ~~which prohibit land-disturbing activities throughout Parcel D-1, will~~ appropriately mitigate any risk to human health relating to the potential presence of ROs in material below 2 ft bgs.

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Project Site:	Parcel D-1, Hunters Point Naval Shipyard, San Francisco, California		

Reviewer:	Department of Toxic Substances Control (DTSC) Comments from Ms. Juanita Bacey, Project Manager Brownfields and Environmental Restoration Program	Date of Comments	Email correspondence dated 13 Nov 2017
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Item	Review Comment	Navy Response	
1	<p>(DTSC General Comment #1)</p> <p>The RACR indicates that sampling and surveys were limited to a depth of 2 ft bgs and that there is a potential for radiological objects to be present in material below 2 ft bgs. Therefore, an unrestricted free release is not possible for this parcel and a Covenant to Restrict the Use of Property (CRUP) will be required. The Conclusion section of the first two documents (are) above recommend unrestricted release. Please revise.</p>	<p>The Final Status Survey (FSS) reports for the former NRDL site and the ship berths have been modified to no longer recommend release to unrestricted use. The two FSS reports are revised to remove the unrestricted release recommendation. They now state that the surface soil and structures meet the Navy's cleanup goals as a result of the MARSSIM based investigation; however, the potential for radiological objects (RO) below 2 feet bgs remains. A LUC/RD addendum will be prepared to address the potential for ROs in subsurface below 2 feet bgs only within the 1946 shoreline expansion area and a buffer that encompasses all recovered ROs at Parcel D-1.</p>	

Reviewer:	California Department of Public Health (CDPH) Comments from Mr. Roger Lupo, via email to Ms. Juanita Bacey, Project Manager, Brownfields & Environmental Restoration, Department of Toxic Substances Control (DTSC) <i>(This review was performed in support of the Interagency Agreement between DTSC and CDPH.)</i>	Date of Comments	Email correspondence dated 14 Nov 2017
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Item	Review Comment	Navy Response	
2	<p>(CDPH General Comment #1 from R. Lupo)</p> <p>In the executive summary on page viii, the text talks of the potential for radioactive objects (RO) below two foot of the ground surface, this will</p>	<p>Comment is noted. Discussion regarding suitability for unrestricted release has been removed. A LUC/RD addendum will be prepared</p>	

Response to Document Review Comments

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	require a land use covenant detailing the need for protective measures in the advent of future soil excavation. Measures to include notification of public of the potential for finding RO's during excavation, notification of the workers of the potential for finding RO's, the need to have Health Physics support during excavation for the protection of the workers and of the public. Measures to include engineered barriers and administrative protective actions to protect the health and safety of the site workers and the public. I am probably getting ahead of the process in mentioning a LUC at this time, but thought I would get the idea started.	spelling out any particular additional or different specific requirements/conditions/ notifications for implementing the institutional controls (ICs) appropriately to address the potential for ROs below 2 feet bgs within the 1946 shoreline expansion area.

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Project Site:	Parcel D-1, Hunters Point Naval Shipyard, San Francisco, California		
Reviewer:	California Department of Public Health (CDPH) Comments from Dr. Sheetal Singh, PhD, Sr Health Physicist, Environmental Management Branch (EMS) via letter addressed to Ms. Juanita Bacey of DTSC <i>-(This review was performed in support of the Interagency Agreement between DTSC and CDPH.)</i>	Date of Comments	15 Nov 2017
Item	Review Comment	Navy Response	
3	<p>(CDPH General Comment #1)</p> <p>The cover page of this work plan does not have appropriate signatures by technical lead and project manager for this project. Please include appropriate signatures in the revised version of the document.</p>	Signatures will be added to the final report.	
4	<p>(CDPH General Comment #2)</p> <p>It is EMB's understanding that the Navy is requesting radiological unrestricted release recommendation (RURR) from CDPH for the first two feet of soil below the ground surface and the soil below the two feet require institutional controls for the following:</p> <ul style="list-style-type: none"> • Remaining sanitary sewer and storm drain line (SSSD) (Work Packages 108, 109, 110 and 111) • Former Naval Radiological Defense Laboratory (NRDL Site), • Ship Berths 14, 21, 22 and 29 • Railroad tie stockpiles <p>Please note that CDPH-EMB cannot approve RURR for the first two feet of all areas of Parcel D-1 Phase II as in these designated areas discrete radiological objects exist below 2 feet. If the Navy plans to implement land use controls and activity restrictions below the two feet of soil, the Radiological Health Branch has to approve this Removal Action Completion Report.</p>	<p>The comment is noted. The FSS reports for the former NRDL site and ship berths have been modified to no longer recommend release to unrestricted use for the surface soil and structures due to the potential that remains for ROs below 2 feet bgs. Unrestricted release request and no further action recommendation for removed SSSD lines are warranted , because none of the except for those SSSD trenches were located within the 1946 shoreline expansion area and a buffer around the 1946 shoreline expansion area and a buffer that encompasses all recovered ROs at Parcel D-1 although a couple of ROs, as potential for RO is limited only within the 1946 shoreline expansion area. Although a A couple of ROs recovered outside of the 1946 shoreline expansion area within the trench excavation</p>	

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		<p>zones and a few ROs four just outside of the expansion area located within the Southwest Block are incidental and the likelihood of ROs outside that area is considered incidental and of low probability.</p> <p>The railroad tie stockpiles no longer are present in Parcel D-1. They were radiologically surveyed, released from radiological controls, and disposed as non-low level radioactive waste.</p>	
Reviewer:	US Environmental Protection Agency (EPA) Comments from Ms. Lily Lee, Remedial Project Manager		Date of Comments 17 November 2017
Item	Review Comment	Navy Response	
5	<p>(EPA General Comment #1)</p> <p>This review does not include comments on Section 5.0, Former NRDL Site Final Status Survey, and Section 6.0, Ship Berths 14, 21, 22, and 29 Final Status Survey, which will be provided on the related Final Status Survey Reports, which are also under review separately. Changes made in response to those comments should be made to Sections 5.0 and 6.0 of the Draft Radiological Removal Action Completion Report Radiological Remediation and Support, Parcel D-1 Phase II (the Draft RACR), as applicable.</p>	<p>The comment is noted. There are no changes to the FSS reports for the former NRDL site or Ship Berths 14, 21, 22, and 29 that require modifications to Sections 5.0 and 6.0.</p>	
6	<p>(EPA General Comment #2)</p> <p>Section 1.4.5 (Work Variances) of the Draft RACR includes four Field Change Requests (FCRs) that require further explanation to fully understand the scope of the activity and approval process for these changes, as follows:</p>	<p>Please refer to the responses to EPA General Comment 2a through 2d below.</p>	

Response to Document Review Comments

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Item	Review Comment	Navy Response
6a	<p>(EPA General Comment #2a)</p> <p>FCR Number 001 states that the Sampling and Analysis Plan (SAP) specified a five-day in-growth period for preliminary screening analysis but that a decision was made in the field that no in-growth was needed. Also, it is unclear whether this screening analysis was for measurements in a field laboratory or a more permanent on-site laboratory. In addition, the text does not state to which analysis or radionuclide this FCR applies. Presumably, this FCR is in reference to the radium 226 (Ra-226) analysis, but this should be confirmed. Please explain why an approved SAP requirement was changed in the field and how it was determined that providing an analysis with no in-growth time would provide usable screening data and specify the radionuclide(s) to which this FCR applies. Please revise the text to include these details and to include information about which oversight and/or Quality Assurance (QA) management approvals were obtained for this change. Finally, please also include information about where the change request and approvals are documented.</p>	<p>The wording in Exhibit 1-3 for FCR No. 001 was modified to clarify that the FCR was prepared in the nature of a correction. The SAP specified a 5-day in-growth period for screening samples by gamma spectroscopy but, as noted in the FCR, the gamma screening method requires no in-growth period and the definitive data method requires a 21-day (minimum) in-growth period, which is part of the laboratory analytical protocol. The in-growth period is necessary to accommodate Ra-226 secular equilibrium and is applied to samples analyzed by gamma spectroscopy where the Ra-226 concentration is to be inferred based on the concentration of its progeny Bi-214. The FCR was prepared by the project chemist, reviewed by the technical director, and approved by the project manager.</p>
6b	<p>(EPA General Comment #2b)</p> <p>FCR Number 003 states that the SAP specified sampling every three meters and conditional Strontium-90 (Sr-90) analysis if pipe segment samples exceeded the Cesium-137 (Cs-137) release criterion. Exhibit 1-3 states that per an agreement with the Navy's Radiological Affairs Support Office (RASO), only ten percent of pipe sediment samples exceeding the Cs-137 release criteria would undergo Sr-90 analysis and confirmation samples for pipe segments would be collected every twenty meters. However, the text does not state why it was considered acceptable to only analyze ten percent of</p>	<p>The wording in Exhibit 1-3 for FCR No. 003 was modified to better explain the solution. The number of samples collected of pipe sediment by rule was found to be excessive and impacting the project schedule. The reduction in number was determined by the Navy to continue to meet the purpose for which the sampling was being performed, i.e., characterizing the sediment itself</p>

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	samples exceeding the Cs-137 release criteria for Sr-90 or why the sampling frequency was decreased from the original requirements in the SAP. Please revise the Draft RACR to address these concerns and to also include information about the specific oversight management and/or QA management approvals that were obtained for these changes and how/where the approvals are documented.	for waste disposal as well as informing excavation activities regarding possible contamination due to leakage. The number of confirmation samples collected from the trenches post-excavation and the types of analyses performed based on the rules were not changed. The rule for analyzing for total Sr based on a Cs-137 exceedance was limited in its application to confirmation samples and was not applied to samples collected for characterizing pipe sediment for waste disposal as well as for informing excavation activities regarding possible contamination due to leakage. The FCR was prepared by the project chemist, reviewed by the technical director, and approved by the project manager.
6c	(EPA General Comment #2c) FCR Number 007 states that the analytical method specified for manganese in the SAP was changed to the same method as that specified for lead. While this may be acceptable, the RACR should specify the actual analytical methods and whether the analytical method change for manganese still met the required detection limit requirement. Please revise the Draft RACR to include this information and to state who was responsible for the approval of this change and how/where the approvals are documented.	An incorrect version of FCR No. 007 was inadvertently attached to the Draft RACR and has been replaced with the correct approved version. In addition, the wording in Exhibit 1-3 for FCR No. 007 was modified to clarify change was in accordance with the SAP.
6d	(EPA General Comment #2d) FCR Number 008 states that the RS-700 system work instruction specified a three hundred second count time for quality control checks but a field change	The wording in Exhibit 1-3 for FCR No. 008 was modified to better explain the FCR was prepared

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	was made to only require a one hundred eighty second count time. Please revise the text to explain how it was determined that the one hundred eighty second count time was sufficient for the purpose of counting quality control check standards and which management or QA staff approved this change and how/where the approvals are documented.	in the nature of a correction of a typographical error. The documents that the work instruction was patterned after call for a 180-sec QC check.
7	(EPA General Comment #3) Section 3.3 (Sampling and Analysis) states the laboratories are accredited under the Department of Defense (DoD) and State of California accreditation programs; however the text does not specify if all three of the listed laboratories have both accreditations, and if the accreditations are applicable to radiological analyses. Please revise this text to include this information.	A sentence was added to Section 3.3, 2 nd paragraph: <i>"The certifications for the matrices and methods held by each laboratory are listed in the SAP (Worksheet #23)."</i>
8	(EPA General Comment #4) The third paragraph of Section 3.3.1 (Radiological Analyses) states that if sample results were greater than or equal to the Cs-137 or Sr-90 release criteria, they were analyzed by alpha spectroscopy for Plutonium-239 (Pu-239). While it is understood that Cs-137 and Sr-90 are fission products associated with the fission of Pu-239, the Historical Radiological Assessment (HRA) indicates that Pu-239 was also obtained in pure form as sources that were used in the Naval Radiological Defense Laboratory (NRDL), yet the text does not indicate whether any samples were analyzed by alpha spectroscopy for Pu-239 without finding exceedances of Cs-137 or Sr-90. Please revise the Draft RACR to address this concern.	The HRA (Section 6.1.2) reports that, <i>"Radioactive sources, including radiography devices, were found to leak radioactivity occasionally."</i> The leaking source was returned to the manufacturer or disposed by regulated means. The HRA continues, <i>"There is historic evidence of sources being repaired, resurveyed, and placed back into service....It is reasonable to assume that any needed clean-up was performed if the leaking source caused radioactive contamination to spread beyond the source container because this was a common practice and necessary to eliminate future problems."</i> A sentence was added to Section 3.3.1, last paragraph, stating,

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		<i>"No samples were analyzed for Pu-239 where there was not an exceedance for either Cs-137 or Sr-90."</i>
9	<p>(EPA General Comment #5)</p> <p>The summary of results should include the associated counting or total propagated uncertainty. Exhibit 4-4, Summary of Radiological Screening Yards (RSY) Sample Results; Exhibit 4-6 Summary of Trench Sample Results; Exhibit 5-2, Summary of NRDL Sampling Results; and Exhibit 6-1, Summary of Ship Berth Sample Results list the maximum concentration of radionuclides of concern (ROCs) detected, as well as any noted release criteria exceedances. However, the results are not reported with the associated counting or total propagated uncertainty, and the text does not state whether any of the maximum results or those that showed an exceedance had any associated qualifiers from the data validation. For completeness and clarity, please revise the tables to include the uncertainty and the text to discuss whether any of the maximum results or those that showed an exceedance had any associated qualifiers from the data validation.</p>	<p>The uncertainties and data qualifiers associated with the sample results are included in the laboratory analytical results contained in the referenced reports supporting the RACR. For brevity they are not included in the summary table exhibits in the RACR body. Section 3.3.3 summarizes data quality issues that were identified with the data themselves.</p>
10	<p>(EPA General Comment #6)</p> <p>Section 4.7 (Trench Survey and Sampling) states on page 29 that dose and risk modeling of the trench surfaces was performed in RESRAD using analytical results, but does not state which sample results were used in the modeling. For example, it is unclear if all data points were entered into RESRAD, if only the maximum results were used, if results that showed exceedances of a release criterion were used, or if only post-remediation sample results were included in the RESRAD model. Please revise the RACR to clarify the results that were input into RESRAD.</p>	<p>Section 2.5, Dose and Risk Modeling, specifically the last bullet of the first paragraph, was clarified to state, <i>"The average radionuclide concentration was used, with the net average concentration above background used for radionuclides present in background (e.g., Ra-226)."</i></p>

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11	<p>(EPA General Comment #7)</p> <p>Section 4.9 (Backfill, Compaction, and Testing of Excavated Trenches, Page 31) of the Draft RACR states that imported backfill material from the “Jericho” soil stockpile underwent appropriate screening and Navy approval in Section; however, Attachment 1 (Jericho Soil Stockpile Radiological Screening Data) does not present results for Sr-90 or Pu-239, which are radionuclides of concern at Parcel D-1. It is uncertain if soil was tested for these radionuclides prior to using the Jericho soil stockpile as backfill material. Parcel D-1 should not be approved for unrestricted use until the fill material is tested for all radionuclides of concern. Please explain why the Jericho soil backfill material was not tested for all radionuclides of concern, notably Sr-90 and Pu-239. Alternatively, please sample the Jericho soil backfill to analyze for Sr-90 and Pu-39 and present results prior to finalization of the RACR to ensure removal action goals were met.</p>	<p>The Jericho soil stockpile, also known as Decker Island aggregate material, consisted of clean (i.e., radiologically non-impacted) offsite fill material brought onsite. The purpose of the sampling was to verify that the material did not contain NORM in concentrations above the release criteria. Attachment 1 was replaced with the complete borrow source assessment, which includes geotechnical, chemical, and radiological test data results.</p>
12	<p>(EPA General Comment #8)</p> <p>The draft describes unexpected radiological objects found in sediment used as fill. Though beyond the scope of these comments, this finding raises the question of potential similar situations elsewhere on the Shipyard where sediment could also have been used as fill and where Tetra Tech EC’s practices may have always followed Workplan requirements. We can revisit this question separately later.</p>	<p>The comment is noted.</p>
13	<p>(EPA Specific Comment #1) - Section 4.4, Trench Excavation, Page 24:</p> <p>The third paragraph states that abandoned steam piping wrapped in asbestos-containing material was found and an asbestos contractor was brought in to monitor the air; however, the results of this air monitoring are</p>	<p>Section 4.4, last paragraph, was modified to clarify that air monitoring for asbestos was not initiated, but continued. The air sample results</p>

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	not presented in this section or referenced. If the results are available, please reference the appropriate section or appendix in the Draft RACR.	for asbestos are found in Appendix E.
14	<p>(EPA Specific Comment #2) -</p> <p>Section 4.5, Radiological Screening Yard Operations, Page 27:</p> <p>Section 4.5 states that samples of soil excavated from installation restoration (IR) sites were analyzed for re-use as backfill or waste characterization but does not discuss what constituents were detected above chemical clean-up goals or how much soil was disposed. As Appendix K, IR Site Chemistry Sampling Results only contains laboratory data, a summary of chemical exceedances that resulted in the off-site disposal of soil should be provided. Please revise the Draft RACR to include a discussion of constituents found above clean-up goals in excavated soil and an associated summary table.</p>	<p>Exhibit 4-2 was modified to include the volume of screened soil disposed as hazardous waste (63 m³). Section 4.5, next to last paragraph, was modified to discuss the specifics of the sample exceedance: <i>“Only one sample exceeded the IR Program site chemical clean-up goal. The sample exceedance was for benzo(a)pyrene in IR 70, which is associated with Zone P. The exceedance resulted in the excavated soil, approximately 63 m³, being disposed as hazardous waste.”</i></p>
15	<p>(EPA Specific Comment #3) –</p> <p>Section 4.6, Removal of Piping and System Components, Pgs 27 through 28:</p> <p>Section 4.6 indicates that non-soil material was characterized, handled, and properly disposed of; however, the volume of non-soil disposed of and the landfill to which it was sent to is not discussed. Additionally, while Section 9.0, Waste Management (Pages 54 through 55), briefly discusses waste management practices, the volume of non-soil disposed off-site is unclear. Please revise the Draft RACR to include additional detail regarding the volume and disposal of non-soil material removed.</p>	<p>A sentence was added to Section 4.6, 1st paragraph, stating: <i>“Approximately 1,642 linear m of piping were removed.”</i> As noted in Section 4.8, 2nd paragraph, piping and non-soil material that exceeded the clean-up goals were turned over to the Navy’s LLRW waste contractor. A sentence was also added to Section 9.0 explaining, <i>“Since the waste was aggregated with that generated by other HPNS projects, no specific volumes for this project are available.”</i> Lastly, a sentence was added to Section 9.1 stating, <i>“The LLRW was shipped for disposal to the US Ecology Idaho</i></p>

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		<i>facility in Grand View, Idaho."</i>
16	(EPA Minor Comment #1) – Appendix H, Daily Activity Reports, PDF Page 2370 and PDF Page 2467: Several pages within Appendix H are out of order, including the Daily Activity Report dated 9/18/17 on PDF Page 2370 and Field Activity Report for 11-26-13 on PDF Page 2467. Please ensure all daily reports are in chronological order.	The order of pages in Appendix H will be corrected in the final report.

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Reviewer:	City and County of San Francisco, Department of Public Health, Environmental Health (SFDPH) Comments from Ms. Amy Brownell, P.E., Environmental Engineer	Date of Comments	22 November 2017
Item	Review Comment	Navy Response	
17	<p>(SFDPH General Comment #1)</p> <p>The subject report describes buried radiological objects (or rusted particles that appear to have come from objects) identified and removed at Parcel D-1 during implementation of Phase II Radiological Removal Actions. The objects were in discrete locations in the top two feet of particular, mostly shoreline, areas of Parcel D-1. Based on the wording in this document, it seems that these objects were not part of the original conceptual site model and that the new theory to account for the objects found and the possibility that other objects may be buried deeper than two feet includes the approximate 1946 shoreline and other details on Exhibit 8-8. The conclusion of this report then attempts to wrap this new conceptual site model into the existing land use and activity restrictions framework that was developed during the CERCLA process for all the other parcels at HPNS. It is also not clear what specific area would be subject to this new conceptual site model. It does not appear that the Navy is proposing that all of the D-1 Phase II Areas or other non-Phase II areas should be subject to this greater than two feet concern. We are not in favor of restrictions being added to areas of Parcel D-1 where there is no evidence to support the need for such restrictions.</p> <p>Parcel D-1, unlike Parcel E-2, Parcel E shoreline and what is now referred to as Lot 2 on IR 7/18, does not include specific restriction language in prior documents for Areas Requiring Institutional Controls for Radionuclides. It is</p>	<p>Section 2.2 addresses the conceptual site model for Hunters Point. Section 2.2.1 includes, as a known and potential source of contamination, the <i>“burial along with excavated fill materials while increasing the footprint of HPNS.”</i> This identified source would include dredge material containing radioactive debris that was used to build up the shoreline post-WWII to its present state. Section 8.3 was modified to better explain and provide definition to the Navy’s understanding regarding the area impacted by dredge material used to expand the land to its current state: <i>“Based on the Navy’s understanding of how shoreline expansion occurred, that potential [for ROs to be present in material below 2-ft bgs in Parcel D-1 Phase II areas] is largely limited to areas east of the 1946 shoreline. The likelihood of ROs outside that area is considered incidental and of low probability.”</i></p> <p>The Navy agrees that areas without potential for ROs should not be restricted. The document has been changed to be consistent with restrictions at</p>	

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	not clear if the Navy wishes to add that type of wording to the documents for Parcel D-1. Or is the Navy proposing a new restriction or new RMP language for this undefined area? Based on our understanding during years of discussion about the framework for the general land use and activity restrictions language that applies to all areas requiring Durable Covers at HPNS, we are not clear that this new conceptual site model can be easily accommodated under the existing restricted activities framework. We would like to discuss this issue and the Navy's proposal, including the aerial extent, to address this new conceptual site model and agree on language to describe this issue in this document. The current language and exhibits do not appear to provide enough detail.	Parcels E, E-2, and 7/18.
18	(SFDPH Specific Comment #2) Executive Summary, Page viii, last paragraph; and Section 8.3, Assessment of Results, page 53, last paragraph; and Section 13.1, Action Memorandum Release Criteria, Page 62: Please see General Comment #1 and please plan on discussing with us how the current framework of activity restrictions will address these concerns.	Information on land use controls will be addressed separate from the RACR.
19	(SFDPH Specific Comment #3) Section 1.3, Current and Future Reuse, Page 5: Parcel D-1 includes a portion of the Shipyard South Multi-Use district (includes residential) in addition to HPS Shoreline Open Space area. Please revise the planned use description for Parcel D-1 to: "The future planned use for Parcel D-1 is mixed use residential and shoreline open space as described by the Hunters Point Shipyard Redevelopment Plan (San Francisco Redevelopment Agency, 2010)."	Section 1.3 revised as recommended.

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20	<p>(SFDPH Specific Comment #4)</p> <p>Section 3.0, Field Activities Overview:</p> <p>Section 3.0 states “Gilbane coordinated license responsibilities and management of radioactive material, including waste, with the Navy and other HPNS contractors...” Please identify the contractors referred to by this statement.</p>	<p>Parties to the MOU as of October 2016 were added to Section 3.0. The parties included TetraTech EC, Inc.; B & B Environmental Safety, Inc.; Chicago Bridge & Iron (CB&I); and Gilbane.</p>
21	<p>(SFDPH Specific Comment #5)</p> <p>Section 3.3.1, Radiological Analyses, page 17, paragraph 2:</p> <p>This section states that “samples for which gamma spectroscopy results indicated the presence of Cs-137 above its release criterion were also analyzed for total strontium.” Should Field Variance No 003 be identified as an exception? The variance states 10% for pipe sediment samples exceeding the Cs-137 release criterion were selected for conditional Sr-90 analysis.</p>	<p>Section 3.3.1, 2nd paragraph, was modified to clarify the samples analyzed for total Sr: “<i>In addition, with the exception of waste characterization samples (e.g., samples collected of sediment in SSSD piping), samples for which gamma spectroscopy results indicated the presence of Cs-137 above its clean-up goal were also analyzed for total strontium.</i>” The rule for analyzing for total Sr based on a Cs-137 exceedance was limited in its application to confirmation samples and was not applied to samples collected for characterizing pipe sediment for waste disposal as well as for informing excavation activities regarding possible contamination due to leakage.</p>
22	<p>(SFDPH Specific Comment #6)</p> <p>Section 3.3.2, Chemical Analyses, page 17, and Sections 9.2 and 9.3, Hazardous Waste and Non-Hazardous Waste, Page 55:</p> <p>Please summarize the results of the chemical analyses. Please identify</p>	<p>The chemical sampling results of excavated soil are discussed in Section 4.5, including the number of samples exceeding chemical clean-up goals</p>

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	comparison criteria and any compounds detected in soil above those levels. Were any chemicals present above the remediation goals established for Parcel D-1? Section 9.2 implies some excavated soil may have been classified as hazardous waste, but does not identify quantity, origin or final disposition. Please clarify and provide these additional details if applicable.	<p>(one sample), the chemical (benzo(a)pyrene), and the resulting volume of excavated soil disposed as hazardous waste (63 m³). See response to Item 14. A reference to Section 4.5 was added to Section 3.3.2.</p> <p>A second paragraph has been added to Section 3.3.2: “ Chemical samples were screened against the remediation goals (RG) for IR Sites presented in the ROD: 11.1 mg/kg for arsenic, 0.33 mg/kg for benzo(a)pyrene, 1.76 mg/kg for benzo(b)fluoranthene, and 6,889 mg/kg for manganese. There were no exceedances, with the exception of sample 04-PD-IR70-003 which exceeded the RG for benzo(a)pyrene at 340 J mg/kg. The associated soil, originating in IR-70, was disposed of as hazardous waste as described further in Section 9.2.”</p>
23	<p>(SFDPH Specific Comment #7) Section 3.2, Gamma Walkover Survey, page 15: Please define the criteria used to identify “potential for elevated residual radioactivity” during gamma walkover surveys.</p>	<p>The sentence was modified to state, “A gamma walkover survey (GWS) was performed prior to sampling to identify locations with the highest potential for elevated residual radioactivity based on their measured levels of gamma radiation.”</p>
24	<p>(SFDPH Specific Comment #8) Section 3.3.3, Data Assessment, page 17:</p>	<p>Information was added to Section 3.3.3 that</p>

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	Please identify entity or entities performing data quality assessment and verification. Please summarize the results of data quality verification activities. For example, please provide a summary of the results of the gamma walkover survey verification activities. Does evaluation of the position-correlated measurement data confirm adequate coverage and adherence to set speeds? In regards to laboratory data, please provide a summary of key findings of the quality control summary reports.	<p>describe the entities who performed the data assessment activities: <i>"A combination of project team members from Gilbane and two of its subcontractors, Envirachem and timmy's Team, including the Project Manager, Data Manager, Project Chemist, and Certified Health Physicist, performed the data assessment of the GWS data. The data assessment activities are summarized in Section 3.2 and presented in the respective project reports (Gilbane, 2016a through e, and 2017a and 2017b). An independent third-party validation company, Environmental Synectics, Inc. (Synectics) of Sacramento, California, performed a manual EPA Level III review on approximately 80 percent of the sampling events, and an EPA Level IV data validation on the remaining 20 percent of the results..."</i></p> <p>An extensive summary of key findings of the quality control summary reports was added to Section 3.3.3. In addition, a discussion of GWS data verification activities was added to Section 3.2: <i>"Collected data were retrieved from the RS-700 and processed using numerical and graphical methods. First, the data were plotted to ensure adequate scan coverage. A tractor speed histogram was developed using the position-correlated data as a quality control check to verify</i></p>

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		<i>the proper speed of the detector over the ground. The data were checked for errors as well as examined for potential outliers and other anomalous features. Descriptive statistics (e.g., range, median, mean, and standard deviation) were used to assess the data set. The data were graphed on a cumulative frequency diagram to test departure from normality and to reveal characteristics of the data distribution such as dissimilar populations and data set outliers that may not be apparent otherwise."</i>
25	(SFDPH Specific Comment #9) Section 4.5, Radiological Screening Yard Operations, page 25, third paragraph: Please define point source.	To improve clarity, the term 'point sources' was replaced with 'discrete radioactive objects.'
26	(SFDPH Specific Comment #10) Section 4.6, Removal of Piping and System Components, pages 27 and 28: The last sentence of page 27 indicates that non-soil material encountered during excavation "such as radioactively contaminated sand blast grit; fire brick; and drums, bottles, jars, and small containers with unknown content" were not sent to the radiological screening yard. Please confirm whether these items were in fact identified. If so, please identify the objects' origins, characterization, and final disposition (e.g., off-site disposal as LLRW).	A sentence was added to Section 4.6 stating, "Material that was identified as radioactive waste was handled as described in Section 9.1." Since only a general inventory of items other than discrete radioactive objects was maintained, the specific items that were identified and disposed of as LLRW cannot be confirmed. The listed examples of specific non-soil material (i.e., radioactively contaminated sandblast grit; firebrick; and drums, bottles, jars, and small

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		containers with unknown contents) was deleted.
27	<p>(SFDPH Specific Comment #11)</p> <p>Section 4.10, Site Restoration, page 31, last sentence:</p> <p>Please include a reference to Section 8.0. Also, please describe the final disposition of the RSY soil that was “scooped up”.</p>	<p>A reference to Section 8.0 was added. In addition, the following description was added to Section 4.10, 2nd paragraph: <i>“The RSY pads were surveyed and sampled, then scooped up. Once determined to be non-LLRW, the pad material was removed and transferred to the Navy’s basewide hazardous waste contractor for waste characterization and appropriate disposal.”</i></p>
28	<p>(SFDPH Specific Comment #12)</p> <p>Section 5.5, Results and Analysis, Page 35, last paragraph and Section 6.4, Results and Analysis, Page 39, last paragraph:</p> <p>See General Comment #1. Referenced Section 8.3 needs to better describe the aerial [areal] extent and the exact details of the Navy’s proposal.</p>	<p>Section 8.3 was modified to better explain and provide definition to the Navy’s understanding regarding the area impacted by dredge material used to expand the land to its current state: <i>“Based on the Navy’s understanding of how shoreline expansion occurred, that potential [for ROs to be present in material below 2-ft bgs in Parcel D-1 Phase II areas] is largely limited to areas east of the 1946 shoreline. The likelihood of ROs outside that area is considered incidental and of low probability.”</i> Exhibit 8-8 was revised accordingly. Information on land use controls will be presented separate from the RACR.</p>
29	(SFDPH Specific Comment #13)	

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	<p>Section 7.0, Railroad Tie Survey and Disposal, page 40:</p> <p>Please provide a "Description and Background" section similar to that provided for the other Phase II investigation areas. It is unclear why railroad ties were investigated as potentially radiologically impacted.</p>	<p>A new Section 7.1 was added: <i>"Salvaged creosote railroad ties collected over time from various areas across HPNS were stockpiled in two locations in Parcel D-1: (1) the southern portion of Parcel D-1 near Ship Berths 22 and 29, and (2) at the head of Gun Mole Pier adjacent to Berth 14, as shown in Exhibit 1-2. The estimated 12,000 used railroad ties existed in various deteriorated states. Since they were considered radiologically impacted, the railroad ties required some form of radiological survey and sampling in order to achieve the Navy's goal of releasing them from radiological controls and disposing them as non-LLRW."</i></p>
30	<p>(SFDPH Specific Comment #14)</p> <p>Exhibit 8-8, Locations where Discrete Radioactive Objects were Recovered, page 52 and Section 8.3, Assessment of Results, page 53:</p> <p>The last paragraph states "...there is the potential for ROs to be present in material below 2 ft bgs in Parcel D-1 Phase II areas where shoreline expansion occurred in Parcel D-1 since 1946 (i.e., where dredge material from the Bay was used to create the present shoreline)." Please clearly identify this area on Exhibit 8-8 and label as "Area with Potential for Buried ROs." Was dredge material used elsewhere in Parcel D-1/other parcels inland of the 1946 shoreline? We note that Exhibit 8-8 shows ROs inland of the historic shoreline. Exhibit 8-8 needs to be revised or a new figure needs to be created to address the concerns in Comment #1.</p>	<p>Dredge spoils were used to expand the land present in 1946 to its current state in Parcel D-1. The ROs found inside of the 1946 shoreline are consistent with the conceptual site model of dredge spoils. Section 8.3 was modified to better explain and provide definition to the Navy's understanding regarding the area impacted by dredge material used to expand the land to its current state as follows: <i>"Based on the Navy's understanding of how shoreline expansion occurred, that potential [for ROs to be present in material below 2-ft bgs in Parcel D-1 Phase II</i></p>

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		<i>areas] is largely limited to areas east of the 1946 shoreline. The likelihood of ROs outside that area is considered incidental and of low probability “. Exhibit 8-8 was revised accordingly. Information. Information on land use controls will be presented separate from the RACR.</i>
31	(SFDPH Specific Comment #15) Section 13.2, Dose and Risk Modeling, Page 63, last paragraph: See Comment #1. It is not clear how the existing restricted activity framework will address the concepts described in this paragraph.	Information on land use controls will be presented separate from the RACR.

Reviewer:	City and County of San Francisco, Department of Public Health, Environmental Health (SFDPH) Comments from Ms. Amy Brownell, P.E., Environmental Engineer	Date of Comments	6 February 2018
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32	(SFDPH Comment #1 - Response to General Comment 1 and Modifications Requested based on review of the Draft Final Document): For SFDPH General Comment #1 and Specific Comments #2, #14 and #15, your response has referenced information on land use controls that will be presented separate from the RACR. We appreciate that the Navy has held additional discussions with us about the 1946 shoreline in this area. We understand that the Navy attributes the presence of radiological objects (ROs) in fill material below two feet to the post-WWII placement of dredge material containing radioactive debris. This information is important and explains the discovery of discrete ROs around the 1946 shoreline. As you have explained, the potential presence of ROs near the 1946 shoreline on Parcel D-1 will result in a	Section 13.3, last paragraph, was modified to state, “Land use and activity restrictions that are currently in place prohibit land-disturbing activities throughout Parcel D-1 in the interim until the LUC RD (ChaduxTt, 2011) is amended to appropriately mitigate any risk to human health relating to the potential presence of ROs in material below 2 ft bgs.”

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	<p>subsequent document with an opportunity for review and comment (e.g. possibly a Memo to File) that will define required activity restrictions based on the possibility of buried radioactive objects below two feet. Since activity restrictions are part of Institutional Controls which are part of the remedy, it seems that the FFA Signatories cannot approve that this Remedial Action and RACR are complete, unlike all prior parcels where the Institutional Control framework was complete and agreed to by all parties prior to final RACR approval.</p> <p>We request that the area requiring institutional controls/land use controls be clearly shown on a figure in this document and then further defined in the referenced future document and that the future document acknowledge uncertainties related to placement of dredge material containing radiological debris. Should the area be slightly larger than the 1946 shoreline and extend to cover to the southwest where ROs have been found or possibly extend to the Parcel D-1/Parcel E boundary? As we stated in previous comments, we are not in favor of a restriction over a wide area solely based on the lack of information. But in this case, there is uncertainty in the exact areal extent of the concern even with the information available. Specifically, the following uncertainties may be helpful in evaluating an appropriate boundary for the ARIC: (1) The Navy has not provided enough supporting information to define the fill placement depth pre- vs. post-use of ROs. Fill is present up to 34 feet thick at IR-53 around Buildings 525 and 530 (near RO-01, -02, and -09) as provided in the Parcel D Remedial Investigation Report and the depth at which ROs may be present is uncertain. This RACR states that "HPNS began using radioactive materials in shipyard operations and NRDL research projects in the early 1940s" and that the "surface of Parcel D-1 is fill and was constructed between approximately 1942 and 1947"; did the material placed</p>	<p>Exhibit 8-8 was modified to show the area requiring institutional controls (ARIC). The area is slightly larger than the 1946 shoreline approximation and includes the southwest area where ROs were found. Additional information regarding the basis for the ARIC was added as Section 8.3.2.</p>

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	<p>pre-1946 include material other than dredge material?; (2) The radiological objects found land-ward of the approximate 1946 shoreline are not only found on the surface (i.e., < 0.5 feet bgs). Rather, the ROs are found up to 2 to 3 feet bgs, which is comparable in depth to those objects found bay-ward of the 1946 shoreline; (3) The accuracy of the approximate 1946 shoreline may vary based on the quality of the referenced aerials; and (4) The Navy cites grading of dredge material as “a ready explanation for the discovery of ROs outside of, but adjacent to, the 1946 shoreline.”</p> <p>In support of drawing the restriction line close to but not exactly on your currently presented 1946 shoreline, we recommend the following revisions to the Navy’s proposed text: “Based on the Navy’s understanding of how shoreline expansion occurred, that [the] potential for ROs to be present in material below 2-ft bgs in Parcel D-1 Phase II areas is largely limited to areas east of—[around] the 1946 shoreline. The likelihood of ROs outside that area [moving away from the 1946 shoreline] is considered incidental and of low probability.”</p>	<p>The text, now found in Section 8.3.1, 4th paragraph, was modified as recommended. Similar text found in the Executive Summary and in Section 13.3 was also modified as recommended.</p>
33	<p>(SFDPH Comment #2 – Request for Regulatory Agencies) We urge the FFA Signatories to provide conditional approval of this RACR, once their concerns have been addressed, pending the subsequent document that will finalize the needed activity restrictions (i.e., the RACR is automatically deemed approved once the subsequent document is approved). In our opinion, the remedy isn't complete until all aspects, including activity restrictions, are defined and the framework for implementation is complete.</p>	<p>Noted. Section 13.3, last paragraph, was modified to state, “<i>Land use and activity restrictions that are currently in place prohibit land-disturbing activities throughout Parcel D-1 in the interim until the LUC RD (ChaduxTt, 2011) is amended to appropriately mitigate any risk to human health relating to the potential presence of ROs in material below 2 ft bgs.</i>”</p>
34	<p>(SFDPH Comment #3 – Response to Specific Comment #6, Section 3.3.2, Chemical Analyses, page 17, and Sections 9.2 and 9.3, Hazardous Waste and</p>	<p>This is conducted by the Navy under a separate TPH program???? The Navy has done hot spot</p>

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	Non-Hazardous Waste, Page 55) The Navy's Response addresses specific comment #6; however, given the detection of benzo(a)pyrene at 340 J mg/kg, we are curious if the Navy confirmed the origin of the soil and whether the area is already being addressed under a chemical remedial action or a petroleum program remedial action?	removals in the past as remedial action in Parcel G. The exceedance identified in IR-70 was based on three samples collected with results for benzo(a)pyrene reported as 0.26, 0.28, and 0.34 mg/kg. The soil was disposed as hazardous waste and clean fill brought in has backfill, which effectively served as a remedial action in response to the elevated chemical of concern.
35	(SFDPH Comment #4 – Section 3.2, Gamma Walkover Survey, page 15) The Navy's response is adequate to explain the purpose of the survey but it doesn't address our comment. Our comment is asking what measurement (i.e. what number) the Navy uses as the comparison criteria "to identify locations with the highest potential for elevated residual radioactivity"?	A sentence was added to Section 3.2, 2 nd paragraph stating, "Locations with measurements greater than three standard deviations above the data set mean were routinely selected for biased sampling."
36	(SFDPH Comment #5 – Section 8.3 Assessment of Results, Exhibit 8-8, Page 55) Please label the fuchsia dotted line as the 1946 shoreline.	Exhibit 8-8 was modified to label the fuchsia dotted line as the 1946 shoreline approximation.
37	(SFDPH Comment #6 – Section 13.3, Discrete Radioactive Objects, page 67) Section 13.3 states "Implementation of land use and activity restrictions as prescribed by the ROD (Navy, 2009) and further detailed by the Land Use Controls Remedial Design in the Final Design Basis Report For Parcel D-1, Hunters Point Naval Shipyard, San Francisco, California (ChaduxTt, 2011), which prohibit land-disturbing activities throughout Parcel D-1, will appropriately mitigate any risk to human health relating to the potential presence of ROs in material below 2 ft bgs." Please see comment 1 and please either delete this statement or modify this statement to reference a subsequent document that will define required activity restrictions based on the possibility of buried ROs below two feet.	Section 13.3, last paragraph, was modified to state, "Land use and activity restrictions that are currently in place prohibit land-disturbing activities throughout Parcel D-1 in the interim until the LUC RD (ChaduxTt, 2011) is amended to appropriately mitigate any risk to human health relating to the potential presence of ROs in material below 2 ft bgs."

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	As written, the Navy's statement is referencing an activity restriction that is only one tiny piece of the framework that allows for redevelopment to happen while "appropriately mitigat[ing] any risk to human health". The referenced activity restriction is part of a framework, that includes a Risk Management Plan, that requires no extra soil handling procedures other than those listed in the Risk Management Plan which are similar to normal construction soil handling protocols. There are no handling protocols in that framework to "address the potential for ROs in subsurface below 2 feet" as stated in your RTCs. If you want to reference this particular activity restriction then you must also reference the future activity restrictions that your Response to Comments says you are going to present separate from this RACR because those are going to be the activity restrictions, based on your RTC's, that will apply to this area bayward of the 1946 shoreline.	See response to first part of comment above.	
38	(SFDPH Minor Comment #1 – Section 1.2, Scope of Work, Page 5) Please delete the end of this sentence as follows: "This radiological RACR does not address chemical contamination and does not include or affected any other designated HPNS parcels. "	Section 1.2, last paragraph, was modified as recommended.	
Reviewer:	California Department of Toxic Substances Control (DTSC) Comments from Ms. Juanita Bacey, Project Manager, Brownfields & Environmental Restoration	Date of Comments	Email correspondence dated 8 February 2018
39	Please note that CDPH EMB previously indicated that a recommendation for unrestricted release (RURR) will not be provided to those areas along the shoreline where soils below a depth of 2 feet were not investigated for ROCs (NRDL Area and Ship Berths 14, 21, 22, 29). Currently, the Executive Summary and Sections 8.3 and 13.3 of the Draft RACR indicate that land use and activity restrictions as indicated in the 2009 ROD or that are already in place will mitigate any risk to human health and prohibit land disturbing activities. The ROD land use restrictions are to address COCs left in place throughout the base, not ROCs. DTSC recommends revising these sections to indicate	The wording in the cited sections was modified to read as follows: "Land use and activity restrictions that are currently in place prohibit land-disturbing activities throughout Parcel D-1 in the interim until the Land Use Controls Remedial Design in the Final Design Basis Report For Parcel D-1, Hunters Point Naval Shipyard, San Francisco, California (ChaduxTt, 2011) is amended to appropriately mitigate any risk to human health relating to the	

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	that additional restrictions to address ROCs in soil below 2 feet will be added to the land use restrictions already prescribed in the ROD (similar to those for IR07/18).	<i>potential presence of ROs in material below 2 ft bgs."</i>	
Reviewer:	US Environmental Protection Agency (EPA) Comments from Ms. Lily Lee, Remedial Project Manager	Date of Comments	Email correspondence dated 9 February 2018
40	(Evaluation of the Response to Item 10, EPA General Comment #6) The response partially addresses the comment. Specifically, the proposed revised text does not clarify which sample results were averaged. For example, it is unclear if only post-remediation confirmation samples were averaged for inclusion in the RESRAD dose and risk modeling or if bias sample results were included as well. Please revise the proposed text to specify the sample results that were averaged for the RESRAD dose and risk modeling.	Section 4.7, 5th paragraph, 1st sentence was modified to state, <i>"Dose and risk modeling of the trench surfaces was performed in RESRAD using the analytical results of samples collected from both systematically-spaced and biased locations representing post-remediation or 'as-left' trench surfaces."</i>	
Reviewer:	California Department of Public Health (CDPH) Comments via email from Ms. Juanita Bacey of DTSC (This review was performed in support of the Interagency Agreement between DTSC and CDPH.)	Date of Comments	Email correspondence dated 26 April 2018
41	(CDPH Specific Comment #1) – in reference to Navy response to Item #4: Navy Response, Review Comment, Item number four, sentence number three; "Unrestricted release request and no further action recommendation for removed SSSD lines are warranted, because none of the SSSD trenches were located within the 1946 shoreline expansion area as potential for RO is limited only within the 1946 shoreline." An overlay of Exhibit 1-2, "Parcel D-1 Site Features Involving Phase II Removal Actions", on top of Exhibit 8-8, "Locations where Discrete Radioactive Objects were Removed", apparently shows multiple Sanitary Sewer and Storm Drains (SSSD) located whole and in part in the area labeled as, "Historical 1946 Shoreline". Please explain.	Exhibit 8-8 was modified to show the location of SSSD trenches within the 1946 shoreline area and the response to Item #4 was modified to read, <i>"Unrestricted release request and no further action recommendation for removed SSSD lines are warranted except for those SSSD trenches located within the 1946 shoreline expansion area."</i>	
42	(CDPH Specific Comment #2) – Exhibit 8-8: It is not clear to the reader if the blue hatched area marked as, "Restriction related to radioisotopes", on Exhibit 8-8, "Locations where Discrete Radioactive Objects were Removed"; is	The legend in Exhibit 8-8 was modified to call the cross-hatching the <i>'Area Requiring Institutional Controls.'</i> A sentence was included in the new	

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	the same area(s) as the, "buffer zone", referred to in page 57, paragraph one, sentence five. Please clarify.	Section 8.3.2 that states, <i>"Therefore, a buffer zone extending beyond the 1946 shoreline approximation is included with the 2 ft bgs restriction for Parcel D-1 Phase II, which is referred to as the area requiring institutional controls (see Exhibit 8-8)."</i>
43	<p>(CDPH Specific Comment #3) – in reference to Navy response to Item #4: Navy Response, Review Comment, Item number four, sentence number four: "A couple of ROs recovered outside of the 1946 shoreline expansion area within the trench excavation zones are incidental and the likelihood of ROs outside that area is considered incidental and of low probability."</p> <p>a. Please note that the sentence number three states, "...as potential for RO is limited only within the 1946 shoreline." Please resolve apparent contradiction.</p> <p>b. Of particular concern are RO-03 and RO-04; which according to Exhibit 8-7, "Recovered Radioactive Objects Data", page 54, are deck markers recovered from Trenches #04-PD-015, Zone O, and #04-PD-016, Zone P, respectively. These ROs are solid deck markers; and therefore cannot be considered effusions from the SSSD line which was removed. Please present a Conceptual Site Model (CSM) which explains the presence of solid deck markers ROs outside the Historical 1946 Shoreline.</p> <p>c. A review of, "Exhibit 8-8, "Locations where Discrete Radioactive Objects were Removed", shows that seven Radiological Objects (ROs) were located inside of the "Historical 1946 Shoreline", while six ROs were located</p>	<p>Sentences were modified to read, <i>"...the potential is largely limited to areas around the 1946 shoreline (Exhibit 8-8). The likelihood of ROs moving away from the 1946 shoreline is considered incidental and of low probability."</i></p> <p>A new Section 8.3.2, entitled, 'Conceptual Site Model,' was added to explain the presence of ROs outside the historical 1946 shoreline approximation.</p> <p>A new Section 8.3.2, entitled, 'Conceptual Site Model,' was added to explain the presence of ROs both inside and outside the historical 1946</p>

Response to Document Review Comments

Document Reviewed:	DRAFT Removal Action Completion Report Parcel D-1 Phase II Radiological Remediation and Support , Hunters Point Naval Shipyard, San Francisco, California.	Date of Document:	DRAFT August 2017 DRAFT FINAL Jan 2017
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<p>outside of the "Historical 1946 Shoreline". This may be more accurately stated as a rough equivalency of 54 percent to 46 percent. Please present a Conceptual Site Model (CSM) which explains the presence of ROs outside the Historical 1946 Shoreline.</p>	<p>shoreline approximation.</p>
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